

L 11129-63

ACCESSION NR: AP3003971

are shown in Fig. 1 of the Enclosure along with the results calculated by the method of moments (shown by the solid line). The measured spectra were found to be in good agreement with theoretical results for all thicknesses of the polyethylene layer at $E_n > 3\text{Mev}$. At $E_n < 3\text{Mev}$ a divergence between the experimental and calculated results was noted. However, the tendency for a change in spectra with an increase in layer thickness in this energy range was the same for both calculated and experimental spectra. At neutron energies from 3 to 4 Mev and polyethylene thicknesses greater than 20 g/cm^2 , the curve of the measured spectra showed a sharper dip than that of the calculated spectra. This is probably due to some inaccuracy in selecting or averaging the cross sections during calculation. The sharper dip in the curve was also noted in neutron spectra measured in water. "The authors thank their coworkers who serviced the reactor and laboratory assistants who assisted in the carrying out of experiments." Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 25Aug62

DATE ACQ: 08Aug63

ENCL: - 01

SUB CODE: NS

NO REF SOV: 003

OTHER: 002

Card 2/32

ACCESSION NR: AT4019060

S/0000/63/000/000/0260/0270

AUTHOR: Avayev, V. N.; Vasil'yev, G. A.; Yegorov, Yu. A.; Kucheryayev, V. A.; Orlov, Yu. V.; Pankrat'yev, Yu. V.; Panov, Ye. A

TITLE: Counters and dosimeters for the study of shielding and shielding properties of materials

SOURCE: Voprosy* fiziki zashchity* reaktorov; sbornik statey (Problems in physics of reactor shielding, collection of articles). Moscow, Gosatomizdat, 1963, 260-270

TOPIC TAGS: counter, scintillation counter, dosimeter, shielding, reactor shielding, nuclear reactor, gamma ray, neutron

ABSTRACT: In the study of the shielding properties of different materials and their combinations, it is important to know the following parameters: coefficients of attenuation of γ -ray and neutron streams of different energies; coefficients of attenuation of the power level of γ -radiation and fast neutrons; yield and spectrum of captured γ -radiation; activation of materials in a neutrons flux; and deformation of the γ -ray and neutron spectra in their passage through the material. Since existing equipment is insufficient for shielding studies, the authors built and tested a number of scintillation counters and dosimeters.

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Among those described are a scintillation counter and spectrometer for the study of the attenuation of γ -ray flux, consisting of a FEU-11B photomultiplier with an NaI(Tl) crystal (diameter and height 40 mm) mounted in a housing lined with aluminum foil, and a scintillation neutron counter consisting of a FEU-11B photomultiplier with plastic scintillator of ZnS(Ag) + lucite (diameter 30, height 10 mm). For neutron energies ≥ 2 MeV, the γ -ray background is calibrated with a Co60 source and eliminated by the proper bias in the analyzer. A similar neutron counter can be used as a monitor. A light guide in conjunction with a smaller counter is used when the opening in the shielding is too small. This light guide is made of organic glass (length 60, diameter 10 mm) and is equipped with a light collector (Tove, P. A. Rev. of Sci. Instr. 27, 143 (1956)). For neutron energies between 1 and 10 Mev, a stilbene crystal is used (diameter 30, height 20 mm) equipped with the γ -discrimination arrangement described by H. W. Broch (Rev. Sci Instr. 31, 1063 (1960)). The detection efficiency for neutrons between 1 and 10 Mev is 10 - 2%. For thermal neutron detection, a FEU-29 or FEU-31 photomultiplier with an Li₂O- 3SiO₂ glass scintillator is used. Detection is based on the reaction $\text{Li}^6 + n \rightarrow \alpha + \text{H}^3$. The sensitivity of these counters to γ rays is calibrated by Zn65 to Co60 sources. All-wave-length neutron counters are constructed as gas counters (type SNM-5) filled with BF₃ and enclosed in paraffin, which is lined on the outside with cadmium. Dosimeters for fast neutrons are

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made from plastic scintillators (polystyrene + terphenyl + ROROR) attached to a FEU-25 photomultiplier. The photomultiplier current is integrated and amplified by a direct current amplifier. The maximum sensitivity of this dosimeter is $0.2 \mu \text{ F/sec}$ per division. In order to eliminate γ -ray background, the measurements are made simultaneously with a γ -ray dosimeter which is a combination of the plastic and inorganic scintillators. A crystal of CsI(Tl) (volume 1.5 cm^3) is mounted on the axis of the plastic crystal (polystyrene + terphenyl + ROROR). Finally, a universal stand for detection and power supply is described. "The authors thank V. M. Isakov, D. I. Chupy*rin, A. I. Vasil'yev, V.N. Kozy*rev and Yu. G. Anisimov for taking part in the construction and adjustment of the apparatus." Orig. art. has: 9 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 14Aug63

DATE ACQ: 27Feb64

ENCL: 00

SUB CODE: NP

NO REF SOV: 015

OTHER: 004

Card 3/3

ACCESSION NR A7500-200

Антонов, Павел Иванович, 1904 г. р., г. Киев, СССР, инж. А.
Кузнецов, Василий Иванович, 1904 г. р., г. Киев, СССР, инж.

TITLE: Attenuation of neutron radiation by serpentine concrete

SOURCE: Atomnaya energiya, v. 15, no. 2, 1965, 12-13.

TOPIC TAGS: reactor radiation, radiation shielding, serpentine concrete, biological shielding, fast neutrons, gamma radiation, reactor shielding

ABSTRACT: The shielding characteristics of concrete (density, 2.2 t/m^3) with serpentine aggregate (introduced as sand or gravel) were studied in a water-moderated water-cooled research reactor. The spatial flux distribution of fast neutrons under conditions of semi-infinite geometry was measured with radioactive threshold indicators made of indium, phosphorus, and aluminum. Spectra of fast neutrons were measured behind concrete barriers 0, 10, 30, 60, and 100 cm thick, and it was established that the greatest spectrum deformation takes place in the 1-4-Mev region. In this energy region, sharp irregularities were

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ACCESSION NR: AP5005802

noticed in a total cross section of neutron interaction calculated for serpentine concrete. The results of measuring spectral neutron distribution can be used for the calculation of multigroup calculation of the total cross section of the concrete. With respect to neutrons, the results of the calculation for the serpentine concrete investigated are similar to those of limonite concrete; with respect to gamma rays, they are the same. In the heat flux calculation of the concrete at temperatures over 480°C, it can be recommended as a material for shielding in nuclear power plants for temperatures up to 450°C. Orig. art. has: 3 tables and 4 figures. [AV]

ASSOCIATION: none

SUBMITTED: 21Feb64

ENCL: 00

SUB CODE: NP, AT

NO REF SOV: 012

OTHER: 001

ATD PRESS: 3189

Card 2/2

VASIL'YEV, G.A., kand. tekhn. nauk (Rostov-na-Donu)

Hydrodynamic interrelation of the inlet apertures of baffles and
of the area of sedimentation of horizontal settling tanks. Vod.
i san. tekhn. no.1:9-12 Ja '66. (MIRA 19:1)

VASIL'YEV, G.A., kand. ekonom. nauk

Automatic lines composed of machine-tool units. Standarti-
zatsiia 29 no.6:7-9 Je '65. (MIRA 18:12)

VASIL'YEV, G.A.; VESELKIN, A.P.; YEGOROV, Yu.A.; MOISEYEV, G.G.;
PANKRAT'YEV, Yu.V.

Moderation of reactor radiations in serpentine sand. Atom.
energ. 19 no.4:354-359 0 '65. (MIRA 18:11)

DESIGN

RECEIVED 10 JAN 64

SUBMITTED: 10 Jan 64

ENCL. 00

SUB CODE: GP

NO REF NOV 64

OTHER 00

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USSR/Electronics - Frequency Stabilizers

FD-2224

Card 1/1 Pub 90-4/12

Author : Barchukov, A. I., Vasil'ev, G. A., Zhabotinskiy, M. E., Osipov, B. D.

Title : Electromechanic klystron frequency stabilizer

Periodical : Radiotekhnika, 10, 29-32, Mar 1955

Abstract : The article describes results of testing an electromechanic klystron frequency stabilizer developed by the authors at the Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR in 1951. The aim of this research was to develop a stabilizer simple in construction and operation, which could also provide an easy means for the klystron frequency changes. To attain these prerequisites in a single block, the functions of cavity resonator and the discriminator were unified, and the modulation of resonant frequency of the cavity-resonator wavemeter was executed by means of a movable membrane.

Institution: Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

Submitted : 16 Apr 1954

VASIL'YEV, G. A.

"Investigation of the Transient Characteristics of Photo-Multipliers by Means of a Micro-Oscillograph"

A conference on Electron and Phot-electron Multiplier; Radiotekhnika i Elektronika, 1957, Vol. II, No. 12, pp. 1552 - 1557 (USSR)

Abst: A conference took place in Moscow during February 28 and March 6, 1957 and was attended by scientists and engineers from Moscow, Leningrad, Kiev and other centres of the Soviet Union. Altogether, 28 papers were read and discussed.

VASIL'YEV, G. A.

AUTHOR: Vasil'yev, G.A.

120-4-18/35

TITLE: Investigation of the Shape and Duration of Pulses from Photo-multipliers ФЭУ-19М and ФЭУ-1В Using a Micro-oscillograph (Issledovaniye formy i dlitel'nosti impul'sov fotoumnozhitel'ey FEU-19M and FEU-1V s pomoshch'yu mikro-ostsillografa)

PERIODICAL: Pribery i Tekhnika Eksperimenta, 1957, No.4,
pp. 66 - 67 (USSR)

ABSTRACT: The simplest method of investigation of the shape and duration of photo-multiplier pulses is direct oscillography. However, usual types of CRTs do not allow oscillograms of pulses with amplitudes ~ 1 V to be obtained without using amplifiers, and the construction of amplifiers with a frequency band greater than 300 Mc/s presents quite a difficult problem. In this connection, micro-oscillographs are of interest because they permit a substantial increase in the deflection sensitivity but still preserve the necessary writing speed. Micro-oscillographs have been known for some time (Ardenne, 1938) but have obtained only a limited application (Refs. 1 and 2) on account of the relatively complicated practical requirements. In this investigation, a micro-oscillographic tube with distributed Cardl/5 deflection systems, as developed by Ardenne and his colleagues

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Investigation of the Shape and Duration of Pulses from Photo-multipliers $\Phi\text{Y-19M}$ and $\Phi\text{Y-1B}$ using a Micro-oscilloscope.

in 1954 (Ref.3) was used. This tube has a deflection sensitivity ~ 0.25 V for the thickness of a line, which on a photo-plate comprises 10 - 12 μ . The tube operates with an accelerating voltage of 30 kV.

The deflection system consists of an artificial line (5 sections) with a mean frequency of 2 600 Mc/s, terminated with its characteristic impedance (100 Ω). The reduction of the sensitivity at 1 000 Mc/s is 5%. The investigated signal is fed to the deflection system by a coaxial cable with a characteristic impedance of 100 Ω .

A property of the micro-oscilloscope is its very large writing field in the horizontal direction (1 000 lines). Thus, with a sweep time of 10^{-7} sec., a scanning speed of 10^{10} lines per sec. is obtained which is sufficient for displaying pulses with leading edge of 5×10^{-10} sec. and amplitudes 1 - 2 V.

For oscillography of photo-amplifier pulses which are statistically distributed in time, it is more satisfactory not to use a waiting timebase, but to trigger the sweep generator periodically (for example, at 50 c.p.s). To avoid superimposition of the oscillograms, it is necessary to move the

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120-4-18/35

Investigation of the Shape and Duration of Pulses from Photo-multipliers $\Phi\gamma$ -19M and $\Phi\gamma$ -1B using a Micro-oscillograph.

photo-film continuously in a vertical direction. In operation, a 5 cm length of film can contain up to 200 scans and register 5 - 10 random pulses. The method described was used for investigation of the shape and duration of black and scintillation pulses from the output of photo-multipliers of the types $\Phi\gamma$ -19M and $\Phi\gamma$ -1B.

Fig. 1a shows a typical micro-oscillogram of a black (single-electron) pulse of the multiplier $\Phi\gamma$ -19M with a supply voltage of 2 600 V. The pulse has an amplitude of $\sim 2V$ (on a load of 100 Ω) and corresponds to an electron multiplication of 5×10^8 . To increase the number of single-electron pulses, a source of γ -radiation (Co^{60}) with an intensity of 25 microcuries was placed near the photo-cathode.

Fig. 1b shows a black pulse from the photo-multiplier $\Phi\gamma$ -1B (supply voltage 2 800 V). Each of the black pulses of large amplitude is accompanied by a pulse-satellite (Fig 1a and b). The experiments showed that this accompanying pulse is not due to the oscillographic circuits but arises in the photo-multiplier itself. The time interval between the fundamental pulse and the satellite is constant and is 7×10^{-9} sec. for photo-

Card3/5 multiplier $\Phi\gamma$ -19M and 8×10^{-9} sec. for the photo-multiplier

120-4-18/35

Investigation of the Shape and Duration of Pulses from Photo-multipliers ФЭУ-19М and ФЭУ-1В using a Micro-oscillograph.

ФЭУ-1В with supply voltages given above. This allows the supposition that the accompanying pulse arises due to optical feedback in the photo-multiplier. Oscillograms of scintillation pulses were obtained in a similar manner with correspondingly lower supply voltages. The pulse parameters obtained from the oscillograms are given in the table. Comparing the duration of the leading edges of the black and scintillation pulses, it can be concluded that in the photo-multiplier ФЭУ-19М, the basic dispersion of the times of flight from the electrons arises on part of the photo-cathode - the first dinode.

Contrarily, in the photo-multiplier ФЭУ-1В, the dispersion is determined mainly by the electron multiplication system. The duration of the edge of the scintillation pulse of the photo-multiplier ФЭУ-1В is 5 times shorter than that of ФЭУ-19М. Thus, with the use of the photo-multiplier ФЭУ-1В, the resolving time and the effectiveness of the coincidence circuits can be improved and also the times of flash of different scintillations can be measured directly. There are 1 figure, 1 table and 3 references, 1 of which is Slavic.

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AUTHOR: Vasil'yev, G.A.

SOV/109-4-8-25/35

TITLE: Transient Characteristics of Photo-multipliers

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 8,
pp 1377 - 1380 (USSR)

ABSTRACT: The transient characteristics of a photo-multiplier are of practical importance in that they illustrate the time response of the system. Such characteristics can be easily determined indirectly. Thus, if $A(t)$ is the response of a photo-multiplier to a scintillation pulse having a form $\exp(-t/T)$, where T is the constant of the scintillator, the transient of the multiplier is given by:

$$h(t) = A(t) + \frac{1}{T} \int_0^t A(\xi) d\xi \quad (1) .$$

Therefore, the construction of the transient response is equivalent to the integration of the scintillation pulse response. On the other hand, by differentiating

Card1/3 Eq (1) with respect to t , it is possible to obtain the

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SOV/109-4-8-25/35

Transient Characteristics of Photo-multipliers

response of the device to a δ -function. Apart from the transient characteristic describing the overall performance of a photo-multiplier, it is necessary to measure the electron spread of the cathode system and the multiplication system separately. The transient response of the multiplication system can be found by integrating the shape of the "dark" pulse. The rise time of the cathode system can therefore be expressed by:

$$\tau_K = \sqrt{\tau^2 - \tau_{YMH}^2} \quad (3)$$

where τ represents the overall rise time of the multiplier and τ_{YMH} is the rise time of the multiplication system. The output pulses of three types of multipliers were investigated experimentally by employing a special oscillograph having a bandwidth of over 1 000 Mc/s and a sensitivity of 0.25 V/one-ray thickness. The investigated photo-multipliers were FEU-19; FEU-33 and FEU-1V. The scintillation response of the multipliers

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Transient Characteristics of Photo-multipliers

is shown in the upper Figures, 2 and 3; the transient response is illustrated in the lower Figures, 2 and 3. The upper curves of Figure 2 were taken by employing the crystals of stilben or plastic scintillators. The upper curves in Figure 3 illustrate the "dark" pulse response. The numerical results obtained from the graphs of Figures 2 and 3 are shown in the table on p 1379. From the table, it is seen that the overall rise times for the three multipliers range from 3.7 to 10.2 mps. There are 3 figures, 1 table and 4 references, of which 3 are Soviet and 1 English.

SUBMITTED: April 15, 1958

Card 3/3

AUTHOR: Vasil'yev, G.A.

SOV/120-59-5-16/46

TITLE: A Travelling-wave Cascade Voltage Multiplier

PERIODICAL: Pribery i tekhnika eksperimenta, 1959, Nr 5,
pp 75 - 80 (USSR)

ABSTRACT: The system, which is considered only theoretically, is that in which rectifier bridges are connected in series in an artificial line (Figure 1). Slater's equations (Microwave Transmission, New York, 1942) are applied; the maximum number of sections that can be used is given by the equation below Eq (7), in which η is the ratio of the wave impedances at the two ends of the line and $\xi = w/w_0$, where w is the working frequency and w_0 is the cut-off frequency of the first section of the line. (Q has its usual meaning.) Eq (8) allows for the finite capacitance C_n of the bridge, etc; the factor b must be less than $2\sqrt{C/C_n}$ but must be more than $1/\eta$.

Figure 2 shows the equivalent circuit of the line.

The section containing Eq (9) deals with the best parameters;

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SOV/120-59-5-16/46

A Travelling-wave Cascade Voltage Multiplier

the voltage U_o applied to the sections is given in terms of P_o (the power supplied) and Z_o and the rectified voltage is given by Eq (10). Figure 3 shows how L and Z must vary along the line (n is the number of some section in the line and N is the total number of sections).

Eqs (11) to (13) are conditions to be satisfied for the theory to be applicable.

The next section deals with the ripple and regulation of the output; the phase shift in the best system reduces the ripple by about a factor 50. Figure 4 shows how the voltage is distributed along the line at no-load.

The next section reports briefly a few tests on a 50-section model, with $2C = 0.1 \mu F$, $L_o = 146 \mu H$,

$L_n = 317 \mu H$, $Q = 40$ (at 300 kc/s, $Z_o = 54 \Omega$, $Z_N = 80 \Omega$, $\eta = 0.68$ and $f_o = 30$ kc/s. It is stated that the system

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worked adequately over the range 150 to 1 000 kc/s and

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A Travelling-wave Cascade Voltage Multiplier SOV/120-59-5-16/46

gave 5 kV at 2 mA.

The last section points out that this system has the advantage that modern semiconductor rectifiers and ferrites can be used to make the size and weight small, since there are no components other than the insulators that have to withstand high voltages. There are 4 figures and 9 references, 3 of which Soviet, 2 Swiss and 4 English.

ASSOCIATION: Fizicheskiy Institut AN SSSR (Physical Institute of the AS USSR)

SUBMITTED: August 21, 1958 ✓

Card 3/3

S/105/61/000/012/003/006
E140/E963

AUTHOR: Vasil'yev, G.A.

TITLE: Tapered transmission lines for cascade voltage multipliers

PERIODICAL: Elektrichestvo, no.12, 1961, 54-59

TEXT: The author solves the equations of a tapered artificial transmission line to determine the conditions under which a cascaded voltage multiplier will have equal voltage increments in each stage. The conditions for physical realizability of such circuits are obtained and it is found that it is necessary to use LC filter sections. An example is given of a tapered line in which the inductance increases and the capacitance decreases with $LC = \text{const}$. With easily obtainable parameter values it was found that at 10 kcs the number of stages could be of the order of 100. There are 5 figures and 8 references (4 Soviet-bloc and 4 non-Soviet bloc). The English-language references read as follows: Ref.1: Everhart E., Lorrain F., The

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Tapered transmission lines ...

S/105/61/000/012/003/006
E140/E963

Cockroft-Walton voltage multiplying circuit, Rev. Scient. Inscr ,
1953, No.24; Ref.8: Milnor J., The tapered transmission line,
Trans. of the AIEE, 1945, v.64.

ASSOCIATION: Fizicheskiy institut im. Lebedev AN SSSR
(Physics Institute imeni Lebedev AS USSR)

SUBMITTED: August 19, 1961

Card 2/2

22000

S/089/61/010/004/011/027
B102/B21226,235/
21,2000

AUTHORS: Balabanov, Ye. M., Vasil'yev, G. A.

TITLE: A traveling-wave cascade generator - a new source for high-voltage supply of accelerator tubes

PERIODICAL: Atomnaya energiya, v. 10, no. 4, 1961, 375-377

TEXT: Cascade generators which are well suited as a high-voltage source for ion and electron accelerators (cf. B. S. Novikovskiy, Atomnaya energiya, 4, vyp. 2, 175 (1958)) have the disadvantage of being very expensive and consuming too much energy in their capacitors ($\sim 10^4$ joules). Since 1957 a traveling-wave cascade generator suggested by Vasil'yev (Priory i tekhnika eksperimenta, no. 5, 75 (1959)) has been tested at the Fizicheskiy institut AN SSSR (Institute of Physics, AS USSR). The circuit (Fig. 1) acts as an LC-filter for the upper frequencies. The bridge rectifier in each stage acts as an additional active load which leads to a decrease of the equivalent factor of the coils. The cascade circuit acts analogously to a section of a long traveling-wave line. In order to have an equal load on all voltage rectifiers at a given current and in order to diminish the harmful power

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B102/B212

A traveling-wave ...

leakage in the matching resistor R, the LC-filter has to be inhomogeneous. The characteristic resistance of the cascade has to increase, which is obtained by either increasing the inductance or by simultaneously increasing the inductance and decreasing the capacitance of the discharge capacitors. Such a circuit may have up to 1000 stages; nevertheless, the capacitance of the capacitors in each stage are not lower than in standard circuits. The dimensions of the induction coils for such a circuit have to be large. In order to keep the dimensions of the whole unit within reasons, the coils are made as flat, closely connected discs, each of which is inductively coupled with 10-20 stages. This design will also decrease the thermal losses in the coils. In a traveling-wave generator circuit, the total pulsation will not exceed that of a single stage in its order of magnitude. A considerable phase shift (100-150°) between the alternating voltages in neighboring stages brings about a compensation of the pulsation. The capacitance of a high-voltage electrode with respect to ground (several 10 μf) is here considerably higher than the output capacitance of a multiplier circuit ($\leq 10 \mu\text{f}$). This also brings about a suppression of pulsations. With $\sim 0.01\%$ this is within tolerable limits. In order to investigate the properties of this cascade generator, the authors have built a unit

Card 2/5

A traveling-wave ...

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S/089/61/010/004/C11/027
B102/B212

(schematically shown in Fig. 3) with 50 stages (250 kv, 1.5 ma, 7-10 kc/sec). Each stage was 25 mm high. Ceramic capacitors of type KЭКБ-1 (KVKБ-1) with a rated capacitance of 68 μ f and selenium rectifiers of type АБС-7-3П (АВС-7-3П) have been used. The induction coils showed a quality factor of $Q = 100-120$ at 8 kc/sec. Each stage of the filter column consisted of four parallel-connected capacitors of the type ПОВ (POV) with a total capacitance of 1500 μ f. The unit has been used successfully for the voltage supply of an accelerator tube. The following advantages of this circuit are emphasized: 1) the possibility of using the same compressed gas for insulation in the system and also as a dielectric in the capacitors; 2) low response time ($\sim 10 \mu$ sec); 3) elimination of excessively high alternating voltage of elevated frequency and of corona discharges associated with it; 4) facilitation of work with semiconductor rectifiers; 5) the possibility of connecting the electrodes directly (without voltage divider) to the accelerator tubes. There are 3 figures and 2 Soviet-bloc references.

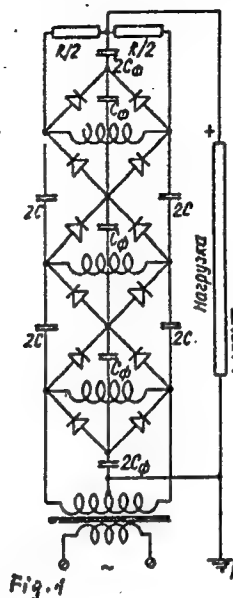
SUBMITTED: September 22, 1960

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A traveling-wave ...

Legend to Fig. 1: R - matching resistor;
2C - discharge capacitors;
 C_ϕ - filter capacitors.

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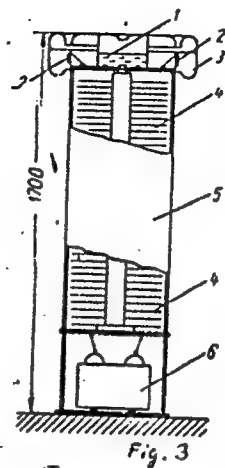


Card 4/5

A traveling-wave ...

Legend to Fig. 3: 1) "oil expander";
2) matching resistor; 3) protective
electrode; 4) cascade multiplier
circuit; 5) paper-bakelite tube
filled with pure transformer oil;
6) 4-kv ferrite transformer.

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S/089/61/010/004/011/027
B102/B212



Card 5/5

S/105/62/000/004/001/002
E192/E482

9:3230

AUTHOR: Vasil'yev, G.A.

TITLE: Distributed network bandpass filter with inductive-capacitative coupling

PERIODICAL: Elektrichestvo, no.4, 1962, 45-49

TEXT: A multi-section travelling-wave LC network can give voltage multiplication exceeding 100. Constructional considerations favour pancake coils; mutual coupling within groups of 10 to 20 coils give delay-line characteristics. With adjoining coils oppositely wound, the cut-off frequency is reduced and the circuit calculations become those for a distributed transformer. Attenuation, phase-shift and loss curves were thus determined and verified experimentally. Comparison with curves for lumped LC filter networks proved that the loss in the coils was reduced by their mutual coupling. In a specimen calculation, coils with self-inductance $L = 1$ henry and capacitances $2C = 140$ picofarads gave a cut-off frequency of 4 kc/s, a load impedance of 45000 ohms at 10 kc/s and a linear Card 1/2

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E192/E482

Distributed network ...

bandpass width from 5 to 15 kc/s. Measurements on networks of 20 to 30 coils showed that the terminations needed inductive impedances having a self-inductance 1.5 to 3 times greater than that of the intermediate coils. For minimum attenuation throughout and a high magnification with a given capacitance, the coils, though geometrically similar, had differing numbers of turns. Suggested uses of the network are: series magnification, HF power supply and transmission of signals to h.v.d.c. circuits; efficiencies of 50 to 70% are expected. There are 5 figures.

ASSOCIATION: Fizicheskiy institut im. Lebedeva. AN SSSR
(Physics Institute imeni Lebedev. AS USSR)

SUBMITTED: December 30, 1961

Card 2/2

L 44314-66 EWT(1) SCTB DD

ACC NR: AP6029426

SOURCE CODE: UR/0205/66/006/004/0618/0619

AUTHOR: Vasil'yev, G. A.; Medvedev, Yu. A. 14/

ORG: State Institute for the Advanced Training of Physicians im. S. M. Kirov,
Leningrad (Gosudarstvennyy institut usovershenstvovaniya vrachey) 6/

TITLE: The role of the adrenal cortex in increasing resistance of x-ray irradiated
white mice to acute hypoxia 2

SOURCE: Radiobiologiya', v. 6, no. 4, 1966, 618-619

TOPIC TAGS: hypoxia, x ray radiation biologic effect, adrenal gland, radiation
tolerance, mouse

ABSTRACT: The effect of x-ray irradiation on resistance to acute (anoxic, anemic, and histotoxic) hypoxia was studied in experiments on white mice irradiated with doses of 50, 100, 200, 500, 700, and 1000 r and observed 3 hr, and 1, 2, 3, 5, 6, and 10 days after irradiation. The content and distribution of sudanophilic and anisotropic lipids in the adrenal cortex, and the weight coefficient and size of the adrenals of 50 irradiated mice were determined. Results on the survival of irradiated animals are presented in Table 1. Resistance to acute anoxic hypoxia was increased by doses from 200 to 700 r; the increase was observed by the third hr after 700-r irradiation and lasted 50 days. Resistance to CO and potassium cyanide was also significantly increased by the 700-r dose. Smaller (50- and 100-r) and larger (1000-r) doses gave

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UDC: 612.014.48

ACC NR: AP6029426

Table 1. The effect of x-ray irradiation on survival of white mice in conditions of general hypoxia.

Experimental conditions	Experimental Group		Control Group	
	Survived	Died	Survived	Died
Pressure chamber exposures for 10-12 min at an ambient pressure of 120 mm Hg, beginning 3 hr after 700-r irradiation (29)	17	12	8	21
The same after 1 day (47)	26	16	13	29
2 days (40)	14	26	8	32
3 days (23)	14	11	10	13
6 days (23)	9	16	11	14
10 days (24)	4	20	8	16
Pressure chamber exposures 1 day after 50-r irradiation (15)	5	10	6	9
100 r (20)	8	12	10	10
200 r (20)	11	9	7	13
500 r (23)	14	11	8	17
1000 r (15)	4	11	5	10
Exposure to CO (8 mg/l for 40 min 1 day after 700-r irradiation (20)	15	5	9	11
Potassium cyanide injection (5 mg (5 mg/kg subcutaneously), 1 day after 700-r irradiation (14)	9	5	4	10

Note: Number of animals, in parentheses, was the same for experimental and control groups.

Table 1. The effect of x-ray irradiation on survival of white mice in conditions of general hypoxia

Card 2/3

ACC NR: AP6029426

no protection. No changes were noted in the weight coefficient or size of the adrenal cortex in mice examined one day after 100- and 1000-r irradiation. The 700-r dose produced statistically significant hypertrophy of the cortex and an increase in weight coefficient by the third postirradiation hr, with the weight coefficient reaching twice normal value by the 2nd, 3rd, 4th, 6th, and 10th postirradiation days. A slight decrease in sudanophilic and increase in anisotropic lipoids was observed in the external branches of the fascicular cortical zone in animals examined the first day after 100-r irradiation, compared to a sharp drop in anisotropic lipid content and change in the aggregate lipid state of the protoplasm of the fascicular cells with the 1000-r dose. The 700-r dose produced a gradual decrease in sudanophilic and anisotropic lipid content from the third hr to the fourth day after irradiation when it reached zero, and a sharp increase on the 6th and 10th postirradiation days, thus confirming an increase in functional activity of the adrenal cortex for the first four days after 700-r irradiation. It was concluded from a comparison of data that the increased resistance of irradiated mice to different types of hypoxia is a non-specific reaction effected through the adrenal cortex. Orig. art. has: 1 table. [SW]

SUB CODE: 06/ SUBM DATE: none/ ATD PRESS: 5073

Card 3/3

VASIL'YEV, G.A.; MEDVEDEV, Yu.A.; PROKOLOVSKIY, V.B.; MAL'YUKHIN, L.V.

Effect of acclimatization to hypoxia on the growth and radiosensitivity of rat lymphosarcoma. Dokl. rad. 15 no.3:37-40 1966.

(MIRA 18:6)

1. Kurs farmakologii (zav. V.B. Prozorovskiy) pri kafedre patofiziologii i farmakologii (zav. - prof. S.P. Senderikhin) Petrozavodskogo gosudarstvennogo universiteta.

PHASE I BOOK EXPLOITATION

SOV/5916

Triunov, L. A., G. A. Vasil'yev, and V. P. Paribok

Protivoluchevyye sredstva; spravochnik (Antiradiation Measures; Handbook)
Moscow, Izd-vo AN SSSR, 1961. 171 p. Errata slip inserted. 5000 copies
printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut tsitologii.

Ed.: V. P. Paribok, Doctor of Medical Sciences, Professor; Tech.
Ed.: R. A. Zamarayeva.

PURPOSE: This handbook is intended for physicians, public health doctors,
and medical research workers who are specializing in radiation medicine.

COVERAGE: The book contains data on more than 500 antiradiation preparations
which have been tested with varying degrees of success on different types
of animals, plants, microorganisms, etc. to determine their effectiveness
as prophylactic agents against radiation affections. The authors have

Card 1/1

Antiradiation Measures; Handbook

SOV/5916

attempted to present in summary form the most important data published to date in the field and to provide a ready guide or standard for measuring the effectiveness of the more recent antiradiation preparations as they are developed. The material is arranged in alphabetical order. In the absence of any special definition, radiation means x-radiation. No personalities are mentioned. Some references appear in the text.

TABLE OF CONTENTS:

Preface	3
Table 1. Doses and Effects of Antiradiation Preparations	5
Table 2. Combined Application of Medicinal Preparations for the Prophylaxis of Radiation Affections	141
Table 3. Clinical Use of Certain Antiradiation Preparations	150

Card 2/3

VASIL'YEV, G.A.

Antibiotic therapy in radiation injury. Voen.-med. zhur. no.6:26-
31 Ju '61. (RADIATION SICKNESS) (ANTIBIOTICS) (MIRA 14:8)

41844
S/205/62/002/004/004/014
I015/I215

27.12.20

AUTHORS:

Tiunov, L.A., Vasil'yev, G.A., and Smirnova, O.I.
(Leningrad)

TITLE:

The effect of lethal X-ray doses on the blood
catalase activity

PERIODICAL: Radiobiologiya, v.2, no.4, 1962, 548-552

TEXT: There are contradictory reports in medical literature about the effect of radiation injuries on the catalase activity in blood. Experiments were carried out on 10 female dogs weighing 14-17 kg. The animals were X-irradiated from two PGM -3 (RUM-3) apparatuses simultaneously. The dose rate from apparatus No.1 was 12r/min. and that from No.2, 10r/min, up to a total dose of 600-650r. The blood catalase activity was determined every 5-10 min during one hour after irradiation. It was subsequently determined every second day during the entire observation period. The activity of catalase was measured manganometrically, according to the method of Bakh and Zubkova. Twenty days after irradiation, only one of

Card 1/2

APPROVED FOR RELEASE

S/205/62/002/004/004/014
I015/I215

The effect of lethal X-ray doses...

the dogs survived. The other animals survived on an average 14.9 days. The blood catalase activity decreased within 5 min after irradiation, and reached its maximum decrease after 20-30 min. The low activity level remained during the subsequent days, with a maximum decrease on the 18th day (one third of the normal). It is assumed that the "catalase mechanism" is related to the primary reactions of the organism to radiation injuries. There are 2 figures.

SUBMITTED: February 5, 1962

Card 2/2

VASIL'YEV, G.A.; BELYAYEV, V.A.

Protective effect against X rays of the adaptation to hypoxia
in combination with an acute hypoxia. Radiobiologiya 3 no.1:
117-120 '63. (MIRA 16:2)
(ANOXEMIA) (X RAYS—PHYSIOLOGICAL EFFECT)

YEVDOKIMOV, Aleksandr Ivanovich; VASIL'YEV, Georgiy Andreyevich;
Prinimal uchastiye ZAUSAYEV, V.I., dots.; PROKHONCHUKOV,
A.A., red.

[Surgical stomatology] Khirurgicheskaya stomatologiya. Izd. 2.
perer. Moskva, Meditsina, 1964. 481 p. (MIHA 17:7)

VASILYEV, G. A.

"Tenth Meeting on Problems in Physiology."

Doctor of Biological Science.

Vest. Ak. Nauk SSSR, No. 6, 1944.

Report U-1551, 7 November 1951.

VASIL'YEV, G. A.

Doctor of Biological Sciences

"Proceedings of the General Assembly of the Academy Science, USSR 14-17,
October 1944" Vest. Ak. Nauk SSSR, No. 11-12, 1944.

BR-52059019

VASIL'EV, G. A.

"Thorndike's method of problem cells and the method of conditioned reflexes."
by Vasil'ev, G. A. (p. 295)

SO: Journal of General Biology(Zhurnal Obshchei Biologii) Vol. X, No. 4, 1949

VASIL'YEV, G. A.

29823

Nyektoryye osobye-nnosti vysahyey nyervnoy dreyatyel' nosti Losh-adyey. Fiziol.
zhurnal SSSR. Im. Syechye-nova, 1949, No. 5, S. 525-34

GOLUBYEVA, N. M.

Sm. 29824

SO: LETOPIS' NO. 40

VASILYEV, G. A. I

7881. VASILYEV, G. A. I Vasil'chenko G. S. Izucheniye eksperimental'nykh
nevrozov v ssha. (Po materialam konferentsii 1952 g. v N'yu-yorke). M.,
Medgiz, 1954. 60 s. 22 sm. 5.000 EKZ. 1R. 60 K.--(55-3572) P

612.82 / 616.8

SO: Knizhuaya Letopis', Vol. 7, 1955

VASIL'YEV, G.A.

Considerations on Penfield's hypothesis of the interrelations
between the cerebral cortex and subcortex in the mechanism of memory.
Zhur.nevr. i psikh. 56 no.7:587-591 '56. (MIRA 9:9)

1. Laboratoriya eksperimental'noy patofiziologii vysshey nervnoy
dyatel'nosti zhivotnykh (zav. prof. B.N.Klosovskiy) Instituta
nevrologii AMN SSSR (dir. prof. N.V.Konovalov), Moskva.

(CEREBRAL CORTEX, physiology,
cortico-subcortical relation in memory (Rus))

(BRAIN, physiology,
same)

(MEMORY,
cortico-subcortical relation in (Rus))

VASIL'YEV, G. A.

EXCERPTA MEDICA Sec 2 Vol 12/1 Physiology Jan 59

- 14 INCREASED RESISTANCE OF ANIMALS TO X-RAY IRRADIATION AS A RESULT OF ACCLIMATIZATION TO HYPOXIA AT NORMAL BAROMETRIC PRESSURE (Russian text) - Vasiliev G. A. - BJULL, EKSP. BIOL. MED. 1958, 45/2 (46-49) Tables 2

Resistance of white mice to subsequent irradiation by X-rays was increased by acclimatization to hypoxia without lowering of barometric pressure. The activity of catalase in the blood and organs of acclimatized animals was increased. (11, 14)

VASIL'YEV, G.A.

Acclimatization to hypoxia associated with the administration of cystamine and cysteamine as a method for preventing radiation sickness [with summary in English]. Med.rad. 4 no.1:41-44 Ja '59. (MIRA 12:2)

(MERCAPTOETHYLAMINES,
cystamine & cysteamine ther. with anoxic acclimatization in radiation protection in animals (Rus))
(RADIATION PROTECTION,
cystamine & cysteamine ther. with anoxic acclimatization in animals (Rus))
(ANOXIA, exper.
acclimatization with cystamine & cysteamine ther. in radiation protection (Rus))

KLOSOVSKIY, B.N., prof.; VOLZHINA, N.S.; VASIL'YEV, G.A. (Moskva)

Physiology of the optic thalamus. Vop.neirokhir. 23 no.6:1-6

N-D '59.

(MIRA 13:4)

1. Laboratoriya po izucheniyu razvitiya mozga Instituta pediatrii AMN SSSR i laboratoriya patofiziologii vysshey nervnoy deyatel'nosti Instituta nevrologii AMN SSSR. 2. Chlen-korrespondent AMN SSSR (for Klosovskiy).

(THALAMUS physiol.)

KLOSOVSKIY, B. N.; VASIL'YEV, G. A.; VOLZHINA, N. S.

Sequelae in extirpation of the optic thalami; technique for their removal, nervous status, behavior and conditioned reflex activity of dogs lacking the optic thalami. Nauch. trudy Inst. nevr. AMN SSSR no.1:364-372 '60. (MIRA 15:7)

1. Institut nevrologii AMN SSSR i Institut pediatrii AMN SSSR.

(OPTIC THALAMUS—SURGERY)
(CONDITIONED RESPONSE)

VASIL'YEV, G.A.

U S S R .

River water as source of salt accumulation in the El'ton Lake. G. A. Vasil'ev. *Trudy Vsesoyuz. Nauch.-Issled.-ovatel. Inst. Galargii* No. 28, 104-113(1953); *Referat. Zhur. Khim.* 1954, No. 37563. --The hydrographic properties of the basins of the 7 rivers emptying into the El'ton Lake are given. The amt. of salts and the kinds brought in by these rivers is indicated. M. Hosh

VASIL'YEV, G. A.

"Thermal Regime of the Bottom Brine in the Upper Salt Strata of Lake El'ton"

Tr. Vses. N. -I. In-ta Galurgii, No 28, 114-117, 1953

Investigations of salt deposits and mineral waters. The author publishes the results of works carried out by the All-Union Scientific Research Institute of Halurgy in 1948-1950. The temperatures of the bottom brine for 1949 at various depths according to observations in 10 wells are presented in a table. The characteristic feature of brine temperatures of a lake is the small variation of the mean yearly temperature with depth and the strong smoothing out of the amplitude of mean monthly temperatures with increasing depth of the layer. (RZhGeol, No 3, 1954)

SO: W-31187, 8 Mar 55

VASIL'YEV, G. A.

"Hydrogeological Characteristics and Hydrochemical Conditions of the El'ton Lake." Leningrad Order of Lenin and Order of Labor Red Banner Mining Inst, Leningrad, 1955. (Dissertation for the Degree of Candidate in Geological and Mineralogical Sciences)

SO: M-955, 16 Feb 56

147-212-1611
VASIL'YEV, G.A.

Hydrochemical characteristics of surface brines of Lake El'ton.
Trudy VNIIG 32:34-48 '56. (MIRA 11:1)
(El'ton, Lake--Brines)

DZENS-LITOVSKIY, A.I.; VASIL'YEV, G.A.

Geologic conditions governing the formation of bottom sediments in Kara-Bogaz-Gol in connection with fluctuations in the Caspian Sea level. Izv.AN SSSR.Ser.geol. no.3:101-109 Mr '61. (MIRA 15:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut galurgii, Leningrad.
(Kara-Bogaz-Gol (Gulf)--Deep-sea deposits) (Caspian Sea)

L 28032-66 EPF(n)-2/ENT(m)/ETC(f)/ENG(m)

ACC NR: AP5026441

SOURCE CODE: UR/0089/65/019/004/0354/0359

AUTHOR: Vasil'yev, G. A.; Veselkin, A. P.; Yegorov, Yu. A.;
Moiseyev, G. G.; Pankrat'yev, Yu. V.

28
B

ORG: None

TITLE: Attenuation of pile radiation in serpentinite sand

SOURCE: Atomnaya energiya, v. 19, no. 4, 1965, 354-359

TOPIC TAGS: nuclear reactor material, nuclear reactor shield

ABSTRACT: The use of serpentine rock for biological shielding is discussed. This mineral is found widely distributed in the Urals, Caucasus, Siberia and Kazakhstan, usually associated with asbestos deposits such as the Bazhenov quarries where pure serpentinite monoliths of about 1 cu m were excavated. Its bound water is liberated only at temperatures exceeding 450° C. Thus it can be used as a heat-resisting material for biological shielding. The concentration of hydrogen nuclei in serpentinite being about 1.5% by weight, is quite sufficient for insuring the attenuation of fluxes composed of intermediate and fast neutrons. The density of monolithic serpentinite is about 2.6 ton/cu m while the thermal conductivity varies between 2.16 and 2.56 kcal/m.hr. C. This material could be easily cut. The compression strength of blocks made of serpen-

Card 1/3

UDC: 621.039.538.4

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L 28032-66

ACC NR: AP5026441

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inite reaches 600 kg/sq cm. The shielding properties of serpentinite fine sand (from Bazhenov deposits) were tested in a water-cooled and water-moderated research reactor. The boxes filled with sand were placed close to the core vessel. The maximum thickness was about 180 cm. The sand density was 1.62 ton/cu m. The chemical composition given in a table shows that the serpentite sand includes 38.83% of SiO₂ and 37.39% of MgO. The investigations were carried out assuming "semi-infinite" and "energy barrier" geometry. The method of induced activity was used for determining the neutron flux attenuation, while the gamma dose rate was measured by means of a scintillation dosimeter. The macroscopic cross-section for fast neutrons in sand was calculated as 0.0602 cm⁻¹ of which 45% was due to oxygen and 21% to hydrogen. The variations of cross sections in serpentite and its main components for different levels of fast neutron energy was shown in a graph. The peaks and dips in curves reflected the dependence of cross-sections upon the presence of oxygen. The attenuation of fast neutrons calculated on the basis of threshold measurements is also graphically illustrated. From these graphs and a table, it follows that the relaxation of neutron in serpentite sand is the same as in boron carbide. The protective properties of serpentite monolithical blocks are considerably higher than those of iron ore concentrates and only slightly better than those of serpentinous concrete. The spectra of fast neutrons were also determined and the

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ACC NR: AP5026441

energy distributions at 0, 30, 60, 100 and 140-cm thickness were plotted for various values of neutron flux. The greatest changes were observed for energy levels from 3 to 8 Mev. The relaxation length varies from 14.9 to 17 cm. The flux attenuation for thermal and epithermal neutrons was also investigated. A certain accumulation of neutrons was observed at small serpentite thicknesses. The relaxation was about 15.2 cm. This length is smaller than that (about 20 cm) obtained for iron ore concentrates. The attenuation of dose rates of fast and intermediate neutrons was the same for tested layer thicknesses. The dose relaxation was 15.2 cm. The gamma dose attenuation was 22 cm for a serpentite layer of 270 g/sq cm. The experiments showed that the serpentite sand is as good as the boron carbide. In conclusion, it was stated that the serpentite is not as good as the iron ore concentrate, although the monolithic serpentite has a lower relaxation length. The serpentite shielding properties could be improved by using a mixture consisting of 25% of serpentite and 75% of iron. The full neutron dose relaxation will be about 9 cm. ORIG. art. has: 4 tables and 3 graphs.

SUB CODE: 18 / SUBM DATE: 29Jan65 / ORIG REF: 11 / OTH REF: 3

Card 3/3 CC

VASIL'YEV, G.D.; TRAVINA, I.O.

Some materials on the exploration of spawning grounds of Atlanto-
Scandinavian herring in April and May [1959]. Trudy BaltNIRO
no.7:63-66 '61. (MIRA 15:2)
(North Sea--Herring)

Substituting fire clay with bentonite in foundry sand for steel casting. G. D. Vasil'yev. *Litovsk Delo*, 1960, No 11-12, pp. 23-25. *Akhim.-Referat. Zhur.*, 4 [6] 97 (1961).—A molding sand containing bentonite was investigated first in the laboratory and then under plant conditions. The mix had the following composition: prepared soil 78.1, quartz sand 21.2, and a 35% bentonite suspension 3.6 or dry bentonite 1.27%. The use of the bentonite mix for steel casting eliminated the necessity of drying and painting the mold, sprinkling with a bonding material, and the use of kerosene. The use of the bentonite mix resulted in less work in the polishing department.

M. Ho

VASIL'YOV, G. D.

USSR/Engineering - Foundry, Equipment Jan 51

"Vacuum Pouring by the Method of Selective Suction of Gases," G. D. Vasil'yev, A. M. Polevaya, Engineers, Orgavtoprom

"Litsey Proiz" No 1, pp 30, 31

Method is used at Gork'kiy Automobile Plant for casting GAZ-51 cyl blocks. It considerably decreases rejection of castings (sometimes by 30%) and permits use of molding and core mixts of increased strength. Installation basically consists of 4 flexible steel hoses attached to

185745

USSR/Engineering - Foundry, Equipment Jan 51
(Contd)

collector, which is connected to suction pump, and vacuum chamber to be installed on mold. Describes procedure and equipment.

185745

185T49

USSR/ Engineering - Foundry, Equipment

Feb 51

"Gas Cupola for Producing Cast Iron and Steel,"
G. D. Vasil'yev, Orgavtoprom

"Izvestiya" No 2, 19, 20

Exptl cupola 300 mm in diam is equipped with 4 flameless burners and incorporates forehearth, heated with 5 flameless burners, air for which is preheated in 2-sec pipe recuperator. Furnace permits obtaining cast iron with temp of 1,500-1,520° in ladle, eliminating necessity of overheating metal in elec furnaces. Productive capacity was 400 kg/hr, corr to gas consumption of 130 cu m per ton of metal produced. Graphitized steel was also made in this furnace.

185T49

Metal 4

Casting Automobile and Tractor Sleeves in Thin-Walled Moulds. P. N. Aksenov, G. D. Vasil'ov, A. S. Kiselev, and B. V. Itabirovich. (Luchnee Proizvodstvo, 1953, (9), 1-6). [In Russian]. Details are given of the production of sleeves for internal combustion engines by B. V. Itabirovich's method of casting in metal moulds faced with a thin layer of refractory material. For this, a sand-clay-coal mixture is applied by means of a blast at 6 atm. pressure. Temperature distribution in the casting, refractory layer and mould is considered, and curves are given for various thicknesses of these. The micro-structure of castings obtained is compared with those produced centrifugally and a wide range of possible applications for steel and cast iron is claimed for the new method. Improvements in the process at present being investigated are outlined. —A. K.

VASIL'YEV, G.D., inzhener; VITKIND, L.M., inzhener; MODEL', B.I.,
tekhnicheskii redaktor

[Oilless binder "P" for core production] Sterzhnevoi bezmaslianyi
krepitel' "P". Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit.
i sudostroit. lit-ry, 1954. 49 p. (MLRA 7:8)

1. Moscow. Gosudarstvennyi Vsesoyuznyi institut avtomobil'noy
tekhnologii.
(Founding)

VASIL'EV, G.F.

USSR/Electronics - Electronic and Ionic Emission

H-2

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 12282

Author : Yelinson, M.I., Vasil'ev, G.F.

Inst : -

Title : Cold Cathode Emission of Tantalum.

Orig Pub : Zh. tekhn. fiziki, 1956, 26, No 8, 1669-1670

Abstract : Short results are given on the investigation of the emission from tantalum points 0.3 -- 0.8 micron in diameter. The investigations were made by means of a spherical or conical Mueller projector.

Card 1/1

PA - 2576

Study of the method applied for reduction of autocathode bombardment by the ions of residual gases.

vantages. The various technological methods worked out by the authors are described. These methods permit all operations to be undertaken with high accuracy and convenience. The process of electrochemically cauterizing the wire point was especially simplified. The various experiments are described, e.g.

1. with active adsorbing films by means of two different methods,
2. experiments of bombarding points of pure tungsten with mercury ions, and
3. tests for the determination of the life of valves and the peculiarities of emission connected herewith.

The system with a strong asymmetric configuration of the electric field is the best means of reducing the detrimental effect of ion bombardment.

(21 illustrations)

ASSOCIATION: not given.

PRESENTED BY: -

SUBMITTED: 30. 7. 1956

AVAILABLE: Library of Congress.

CARD 2/2

VASIL'YEV, G.F.

PA - 2598

AUTHOR:
TITLE:

ELINSON, M.I., VASIL'YEV, G.F.
Experimental Research of the Field Emission of Hexaborid Lantan.
(Eksperimental'noye issledovaniye avtoelektronnoy emissii
geksaborida lantana, Russian)
Radiotekhnika i Elektronika, 1957, Vol 2, Nr 3, pp 348 - 350
(U.S.S.R.)
Received: 5 / 1957

Reviewed: 6 / 1957

PERIODICAL:

ABSTRACT:

Compressed and caked together rods of LaB_6 with a diameter of 1 mm and a length of 15 mm served as initial object. Investigation of the emission characteristics was carried out in autoelectron diodes. The usual measuring scheme was used. At some of the characteristics a tendency towards saturation was observed. Between these sections there are some "steps". It was shown that these "steps" are not connected with any nonreversible phenomena whatever. The appearance of the characteristics confirms that the borid, cooled to room temperature (after a treatment at high temperature), at least in the layer bordering on the surface, is a semiconductor. The existence of several steps (and not, as it ought to be according to the theory by R.Stratton (Proc.Phys.Soc. B., 1955, 68, 430 B, 746 - 757) only one) may be connected with the fact that for different places of the emitter the electric field is different and the breaf-through of the barrier takes place successively at different places and at different orders of u .

Card 1/2

PA - 2598

Experimental Research of the Field Emission of Hexaborid Lantan.

It is, however, also possible that these steps are connected with the polycrystalline shape or with the presence of some energy levels of the electrons on the surface. Preliminary experiments showed that the LaB_6 emitter possesses sufficient stability. At present further investigations of the substances described are being carried out. (4 illustrations).

ASSOCIATION: Not given.

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress.

Card 2/2

VASIL'YEV, G.F.

PHASE I BOOK EXPLOITATION

SOV/1804

9(3)

Yelinson, Mordukh Il'ich, and Vasil'yev Gennadiy Fedorovich ~~the author~~

Avtoelektronnaya emissiya (Electron Field Emission). Moscow, Fizmatgiz,
1958. 272 p. 6,000 copies printed.

Ed.: Ye. L. Starokadomskaya; Tech. Ed: N. Ya. Murashova.

PURPOSE: This book is intended for engineers and technicians working in electronics and can also be useful to upper division and graduate students specializing in this field.

COVERAGE: According to the authors this book is the first systematic presentation of the results of theoretical and experimental work in the field of electron field emission. The authors see the possibility of practical application of this phenomenon to radio physics and electronics. The introduction is a short exposition of basic data on the energy distribution of electrons in crystals and on the nature of the potential barrier at the boundary of metals and semiconductors (dielectrics) in a vacuum. Chapters 1 and 2 cover the theory and experimental research in electron field emission of metals. In Chapter 3 the author examines

Card 1/₂

SOV/1804

Electron Field Emission

the cause of the non-stability of emission and possible ways of increasing the stability of emission characteristics. In chapter 4 the authors examine the theory and extremely limited experimental research done in field emission of semiconductors. In chapter 5 the authors discuss aspects of the problem of nonmetallic complex autoelectronic emitters. Chapter 6 contains data on the use of electron field emission in the cathodes of electron equipment and in electron-emission microscopes of high resolving power. M.I. Yelinson wrote the Introduction and Chapters 1, 3, and 5. Chapters 1, 4, and 6 were written by M.I. Yelinson with the cooperation of G. F. Vasil'yev. The authors give recognition to D. V. Zernov, Corresponding Member of the Academy of Sciences of the USSR, and V. A. Gor'kov, T. I. Kofanova, and A. A. Yasnopol'skaya for their help in compiling the volume. There are 243 references, 84 of which are Soviet, 35 German, 3 Japanese, and 120 English.

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Card 2/6	

SOV/109-3-7-10/23

AUTHORS: Yelinson, M.I. and Vasil'yev, G. F.

TITLE: Investigation of the Field Emission of Lanthanum Hexaboride
(Issledovaniye avtoelektronnoy emissii gekhsaborida lantana)

PERIODICAL: Radiotekhnika i elektronika, 1958, Vol 3, Nr 7,
pp 945-953 (USSR)

ABSTRACT: The work described aimed at the investigation of the field emission of LaB_6 , in particular, the investigation of the mechanism of the emission, the adsorption properties, and chemical stability when subjected to ion bombardment. The investigated samples were in the form of bars having dimensions $1.5 \times 1.5 \times 20$ mm. These were shaped into sharp points by means of etching baths, the best results being obtained by electrolytic etching in concentrated sulphuric acid by using direct current. The points were then washed in ammonia. The emissive points were then degassed; several methods were tried (as illustrated in Fig.2) and it was found that at temperatures below 1300°C a thin dielectric film was formed on the points; this could be eliminated if the samples were heated up to 2000°C . First, the emission patterns of the samples were taken; Fig.4a shows the emission pattern of a cold point, while Fig.4b illustrates the pattern of a sample heated to a temperature of 850°C .

Card 1/4

DOV/109-3-7-10/23

Investigation of the Field Emission of Lanthanum Hexaboride

The voltage current characteristics of various samples are shown in Fig.5. Curves a and b of Fig.5 correspond to emitter temperatures of 0° and 850°C, respectively; Curve 1 of the figure was taken immediately after heating the emitter, while Curves 2, 3, 4 and 5 were taken after 10, 30, 60 and 90 minutes after heating. A typical graph of the emission current as a function of time is illustrated by Curve 1 in Fig.6; Curve 2 in the figure shows the current for the case when the voltage was randomly interrupted. Fig.7 shows voltage-current characteristics of a LaB₆ emitter immediately after heating to a temperature of 1500°C, and then 15 minutes after the completion of the heating cycle; two similar curves for the heating cycle up to 850°C are also shown. From Fig.7 it is concluded that the work function of the emitter increases by about 60% when the sample is subjected to poisoning and, secondly, that the mass of the adsorbed gases is eliminated at 850°C. The

Card 2/4

SOV/109-3-7-10/23

Investigation of the Field Emission of Lanthanum Hexaboride

temperature dependence of the field emission current is illustrated by the curves shown in Fig.8. A number of samples were subjected to pulse tests at voltages ranging from 9 to 20 kV and at current densities of the order of 10^7 A/cm². It was found that a vacuum-type arc discharge was formed when the current densities were excessive. The effect of ion bombardment on the emission was investigated by measuring voltage $u(t)$ for constant currents, at various pressures of the bombarding mercury. The results are shown in Fig.9 for pressures ranging from 10^{-7} up to 3×10^{-5} mm Hg; the figure shows similar curves for tungsten and rhenium. A large number of the voltage current characteristics measured by the authors differed from the standard straight lines, which normally characterise the field emission of metals. Consequently, it was thought that the emission mechanism in LaB₆ is different from that of metals. It was found, however, that the main cause of the non-linearity is the poisoning of the emitters during the measurement of the characteristics (lasting up to 10 sec). By employing an oscillograph the time of measurement could

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Investigation of the Field Emission of Lanthanum Hexaboride

be reduced to less than 0.5 sec and it was found that the voltage current curves were linear, as shown in Fig.10. The paper contains 10 figures and 4 references, 2 of which are Soviet and 2 English.

SUBMITTED: November 29, 1957.

1. Lanthanum borides--Adsorptive properties
2. Lanthanum borides--Chemical properties
3. Lanthanum borides--Bombardment
4. Ion bombardment
5. Field emission--Analysis

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SOV/109-3-7-16/23

AUTHOR: Vasil'yev, G. F.

TITLE: On the Problem of the Theory of Field Emission of Semiconductors (K voprosu o teorii avtoelektronnoy emissii poluprovodnikov)

PERIODICAL: Radiotekhnika i elektronika, 1958, Vol 3, Nr 7, pp 962-964 (USSR)

ABSTRACT: The expression for the emission of the potential barrier at the boundary of a hard substance and vacuum, as derived by Murphy, can be used to develop a theory of the field emission in semiconductors. The transmission coefficient for the barrier is given by Eq.(1), where the various coefficients are defined by Eqs.(2). If the parameter y in Eq.(2) is replaced by κy , where κ is given by Eq.(3), Eq.(1) is also valid for semiconductors. The number of electrons having normal impulse components (per unit surface and unit time) is expressed by Eq.(4) for the case of degenerate electron gas and by Eq.(5) for non-degenerate electron gas, in Eqs.(4) and (5), ζ denotes the Fermi level, k is the Boltzman constant, T the absolute temperature, and n the concentration of electrons in the conduction zone. The density of the field emission current is expressed by Eq.(9). Consequently the current for the case of the degenerate

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30V/109-3-7-16/23

On the Problem of the Theory of Field Emission of Semiconductors

electron gas is expressed by Eq.(10); this is applicable within the limits defined by Eqs.(11); the coefficients b , c and d in Eq.(10) are defined by Eqs.(12), (13) and (14). For the non-degenerate electron gas, the emission current is given by Eq.(15), where Φ is expressed by Eq.(16). The applicability of Eq.(15) is defined by the limits given by Eqs.(18). The author expresses his gratitude to M. I. Yelinson for valuable advice and discussion. There are 2 English and 1 Soviet reference.

SUBMITTED: January 20, 1958.

1. Semiconductors--Electrical properties
2. Field emission--Theory
3. Mathematics

Card 2/2

AUTHORS: Yelinson, M.I. and Vasil'yev, G.F. ^{SOV/109-4-4-22/24}

TITLE: Certain Peculiarities of the Field Emission of Germanium
(Nekotoryye osobennosti avtoelektronnoy emissii germaniya)

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 4,
pp 728 - 729 (USSR)

ABSTRACT: The field emission of n-type germanium was investigated and the results are shown in Figures 2 and 3. The investigated samples were in the form of bars having dimensions 1 x 1 x 10 mm and were prepared from a crystal having a resistivity of 2-10 Ω cm. The bars were electrolytically etched into fine points (Figure 1). A typical voltage-current curve of this type of emitter is shown in Figure 2; the middle portion of the characteristic is rectilinear, while in the region of small currents, the characteristic deviates from the linearity; also at large currents the characteristic is non-linear and the current has a tendency to increase. Figure 3 shows two voltage-current curves taken at two different temperatures; these correspond to comparatively small currents.

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SOV/109-4-4-24/24
AUTHORS: Vasil'yev, G.F., Politova, N.M., Shabel'nikova, A.E.,
Pervova, L.Ya. and Yasnopol'skaya, A.A.
TITLE: Interdepartmental Seminar on Cathode Electronics (The 11th
Meeting) (Mezhduvedomstvennyy seminar po katodnoy
elektronike) (11-e zasedaniye)
PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 4,
pp 731 - 732 (USSR)
ABSTRACT: A meeting of the seminar took place on December 1, 1958
at the Institut radiotekhniki i elektroniki AN SSSR
(Institute of Radio-engineering and Electronics of the
Ac.Sc.USSR). During the meeting 8 papers were read.
Yu.G. Ptushinskiy read a paper entitled: "Kinetics of
the Adsorption of Oxygen on the Surface of Tungsten".
The second paper, by I.M. Dykman and S.M. Pekar,
dealt with "The Admixture Photo-effect of Semiconductors
in the Region of the Exciton Light Absorption". The
paper by T.L. Matskevich was devoted to "The Problem of
the Secondary Electron Emission of Fine Films of a
Number of Organic Substances". The problem of "Surface
Ionisation in a Strong Electric Field on a Surface with
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SOV 109-4-4-24/24
Interdepartmental Seminar on Cathode Electronics (The 11th Meeting)

a Non-homogeneous Work Function" was considered by E.Ya. Zandberg and N.I. Ionov. I.N. Bakulina and N.I. Ionov read a paper entitled "Determination of the Electron Attachment Energy and of the Potentials of Atoms by the Method of Surface Ionisation". N.L. Yasnopol'skiy and A.P. Alekseyevadealt with the problem of "Passage of Steady-state Currents Through a Dielectric When the Current Carriers Are Introduced Through One of the Contacts by Means of Electron Bombardment". The lecture by D.A. Ganichev and K.G. Utkin discussed the following - "The Possibility of the Analysis of the Total-energy Distribution of Electrons in a Quasi-spherical Condenser". The work by M.L. Kapitsa, S.A. Fridrikhov and A.R. Shul'man dealt with an investigation of the secondary electron emission and the characteristic energy losses of a number of dielectrics (glass, mica, fluorite and alkali-haloid monocrystals).

Card 2/2

USCOMM-DG-60997

VASIL'EV, G.F. Cond Phys-Math Sci (diss) " Investigation of the
electrostatic emission of certain refractory compounds with
semiconductor and metallic conductivity," Tashkent, 1960, 14 pp
(Tashkent State University in V. I. Lenin) (EL, 39-60, 113)

88163

S/109/60/005/011/012/014
E140/E485

9,3140 (2301, 1003, 1140)

AUTHOR: Vasil'yev, G.F.

TITLE: Influence of the Shape of Potential Barrier at the
Emitter-Vacuum Interface and the Electric Field
Distribution Over the Emitter Surface on the Shape of
Volt-Ampere Field-Emission Characteristics

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.11,
pp.1857-1861

TEXT: Recently published work (Ref.1) have shown anomalous
behaviour of the volt-ampere field emission characteristics in the
neighbourhood of field strength 8.107 V/cm. The majority of
authors explain the observed behaviour by the presence of space
charge above the emitter surface. The present article is based on
the image-field approach to this problem, calculating the image
forces, however, with a correction for the atomic structure of the
emitter. Further, the field strength at the emitter surface is
calculated on the basis of an analytic approximation to the
commonly used point emitter geometry. It is shown that the purely
geometric approach used here can, at least, partially explain the

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S/109/60/005/011/012/014
E140/E485

Influence of the Shape of Potential Barrier at the Emitter-Vacuum Interface and the Electric Field Distribution Over the Emitter Surface on the Shape of Volt-Ampere Field-Emission Characteristics

anomalous behaviour observed. There are 2 tables and 15 references: 4 Soviet and 11 non-Soviet.

SUBMITTED: March 31, 1960

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20421

S/109/60/005/012/019/035
E192/E382

9.4300 (1043, 1143, 1150, 1161)

AUTHORS: Yelinson, M.I., Zhdan, A.G. and Vasil'yev, G.F.

TITLE: Interpretation of the Shape of Voltage-current Characteristics of the Field Emission in Semiconductors

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol. 5, No. 12, pp. 2004 - 2008

TEXT: A typical voltage-current characteristic in $\lg j$ and $1/E$ coordinates for metals is in the form of a straight line for a wide range of currents i and voltages u . Such a characteristic is shown in Fig. 1. However, at current densities $j > 7 \times 10^6 \text{ A/cm}^2$ a considerable deviation from the linearity is observed. Thus, a characteristic bend appears in the vicinity of the point A (Fig. 1) which occurs at lower j . Further, in the vicinity of the point B the rate of the current increase becomes greater again. The deviation at the point A can be explained by the effect of the space charge of the emitted electrons and by the deviation of the true form of the potential barrier

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S/109/60/005/012/019/035
E192/E382

Interpretation of the Shape of Voltage-current Characteristics
of the Field Emission in Semiconductors

from the classical law of the image forces. Also it should
be taken into account that at high electron energies the
transfer coefficient of the potential barrier is given by

$$\left[1 + \exp \left[\frac{4 \sqrt{2} m^{1/2} |E_x|^{3/2}}{neE} \right] \right]^{-1} \quad (1)$$

The reason for the rapid increase of j in the vicinity
of point B is not yet clear. For the semiconductors
a typical voltage current characteristic for field emission
at low temperatures is also in the form of a straight line.
However, very often the experimental characteristics deviate
from rectilinear form and these deviations can be of various
types. Such characteristics for the emitters made of

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E192/E382

Interpretation of the Shape of Voltage-current Characteristics
of the Field Emission in Semiconductors

$\text{SiO}_2 + \text{C}$ and $\text{Al}_2\text{O}_3 + \text{C}$ were investigated in an earlier work (Ref. 2). It was found that the possible reason for the deviation of these characteristics from linearity is the influence of the strong internal field in the semiconductor, which changes the distribution function and the electron concentration. The characteristics of SiC, Ge and ZnS (taken from Refs. 3, 4, and 5) are also shown. The peculiarity of these three characteristics is the deviation from linearity at small currents. A new type of voltage-current characteristic was discovered. The materials used in the investigation were semiconductors based on SiO_2 and Al_2O_3 . In order to make these emitters conducting, SiO_2 was activated with carbon and tungsten was added to Al_2O_3 . The particular feature of these substances is their low electron affinity coefficient $\chi \approx 1 \text{ eV}$ (Ref.2).

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S/109/60/005/012/019/035
E192/E382

Interpretation of the Shape of Voltage-current Characteristics
of the Field Emission in Semiconductors

The voltage-current characteristics of three emitters made from $\text{SiO}_2 + \text{C}$ is shown in Fig. 6. It is seen that the characteristics deviate from linearity at low currents (see point G). These characteristics are novel in that the bend at point G has nothing to do with the barrier produced by the presence of the surface charges since this is overcome at comparatively low electric fields. This is due to the fact that emitters have a very high resistance and in the investigated range of currents they have considerable internal fields. Secondly, the space-charge effect is insignificant due to the fact that the emitted currents are very low. In general, the characteristics of the type shown in Fig. 6 can be obtained at higher temperatures; in fact, at room temperatures the characteristics are often rectilinear while at higher temperatures they have the shape shown in Fig. 6.

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E192/E382

Interpretation of the Shape of Voltage-current Characteristics
of the Field Emission in Semiconductors

The shape of the characteristics can be explained if it is assumed that $\Theta(y) \approx 0$, where Θ is the Nordheim function. This means that the potential barrier at the boundary between the semiconductor and vacuum practically disappears and the exponential emission law is replaced by a comparatively slowly increasing function such as $i = kE^2$. There are 7 figures and 6 references: 3 Soviet and 3 non-Soviet.

SUBMITTED: March 12, 1960

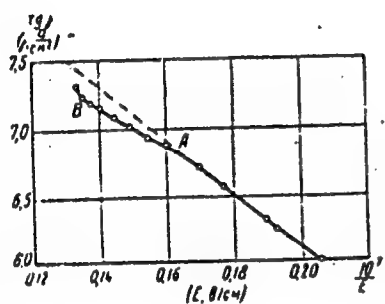
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20427

S/109/60/005/012/019/035
E192/E382

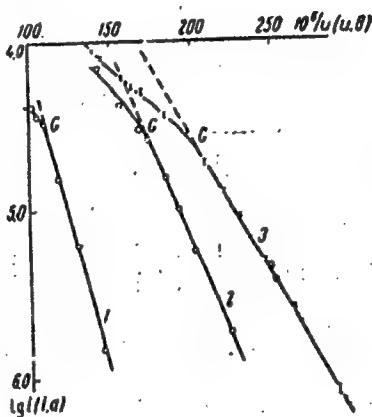
Interpretation of the Shape of Voltage-current Characteristics of the Field Emission in Semiconductors

Fig. 1:



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Fig. 6:



VASIL'YEV, G.F.

Electric field penetration in a semiconductor. Radiotekh. i
elektron. 6 no.10:1741-1744 0 '61. (MIRA 14:9)
(Semiconductors) (Electric fields)

L 15370-66 EWT(1)/EWP(e)/EWT(m)/T/EWP(t)/EWP(b) IJP(c) JD/GG

ACC NR: AP6804471

SOURCE CODE: UR/0048/66/030/001/0071/0074

AUTHOR: Markov, V.S.; Prokopenko, V.S.; Pak, N.G.; Vasil'yev, G.G.

ORG: Krasnoyarsk State Pedagogical Institute (Krasnoyarskiy gosudarstvennyy pedagogicheskiy institut)

TITLE: Oscilloscope display of the hysteresis loops of separate parts of a film /
Transactions of the Second All-Union Symposium on the Physics of Thin Ferromagnetic
Films held at Irkutsk 10 July to 15 July, 1964

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.30, no. 1, 1966, 71-74

TOPIC TAGS: ferromagnetic film, magnetic thin film, Faraday effect, Kerr effect, hysteresis loop, magnetic anisotropy,

ABSTRACT: Equipment employing the Faraday or Kerr effect is described with which one can display on an oscilloscope screen the hysteresis loop of a small region of a ferromagnetic film. In the authors' apparatus a spot of polarized light from several millimeters to several tens of microns in diameter was focused on the investigated film and the reflected or transmitted light (depending on the thickness of the film) was collected, passed through an analyzer, and focused on a photomultiplier. The signal from the photomultiplier was applied to the vertical axis of an oscilloscope, to the horizontal axis of which there was applied a signal proportional to the magnetizing field. A number of exploratory experiments were performed and hysteresis loops are

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ACC NR: AP6004471

presented. By recording both the longitudinal and transverse hysteresis loops with different orientations of the film it is possible to map the direction of the anisotropy axis in different parts of the film. The accuracy with which the direction of the local anisotropy axis can be determined is at least great as can be obtained with the technique of D.O. Smith (J. Appl. Phys., 32, 70 (1961)), which requires observation of the domain structure. Orig. art. has: 8 figures.

SUB CODE:

20

SUBM DATE:

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ORIG. REF: 001

OTH REF: 001

TS
Card 2/2

S/122/61/000/011/003/506
D221/D304

AUTHOR: Vasil'yev, G. G.

TITLE: The manufacture of plastic dies

PERIODICAL: Vestnik mashinostroyeniya, no. 11, 1961, 54 - 58

TEXT: The dies made of plastic material based on epoxy resin are economical for small batch production, although the plastic is more expensive than metal. Their life can be extended by metal spraying, and the use of copy millers for machining these tools is eliminated. The labor involved is about half of that required for the manufacture of metal dies, because plastic tools are cast. This is done by making a replica in plaster of Paris of the master model. The author describes in detail the actual process, as well as the casting of the form. In the case of phenolic resin, it is cooled to 18-20°, when a hardening agent, called the contact of Petrov is introduced. The composition is mixed and its temperature is maintained by water circulation in the jacket of the mixer.

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S/122/61/000/011/003/006
D221/D304

The manufacturing of plastic dies

After casting it is held for a day in room temperature, dried and heat treated at 500 during 24 hours, 600 -for 12 hours, and 800 12 hours. The cooling takes place at room temperature. The dies made of phenolic resins are cheaper than those based on epoxy materials, however, their life is shorter, and their use is limited to shallow drawing. The plastic ~~ТЛК-Э~~ (TLK-E) is made of resin based on cellulose ester, and is applied for punches in stamping sheet metal parts in board hammers. The working parts of dies made in acrylic resins are reinforced with glass fibres, and form ACT (AST-T) plastic. Whenever low specific pressures are required for stamping, then plastic dies are expedient. The plastic section of the tool is joined to the metal part by bolts or epoxy resin. When machining, when this arises, is executed in normal machine tools. The corrosive action of their chips on machine tool components should be taken into account. The high quality epoxy resin facing of the working parts of dies is at present widely used. A forming tool of this kind is designed for operation in a board drop hammer.

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The manufacturing of plastic dies

S/122/61/000/011/003/006
D221/D304

The epoxy resin adheres well to metal and there is no need for bolt fastening. A hardly noticeable contraction after casting of the form dispenses almost entirely with machining. The author provides details of casting process, as well as the composition of the facing, and a note is made that dies should be made with harder surface than punches. The reduction of cost can be attained by introducing cores of wood, metal or cheap plastic. The practice of the "Karosa" Factory (ChSSR) in this respect is recalled. As examples, some tool designs are illustrated and the procedure of die manufacture is described. Details are also given of the method of metal spraying which ensures a longer life of the tool. Finally the process of facing with plastic of large dies with core made of concrete is discussed. There are 12 figures. ✓

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PA 28/49T103

VASIL'YEV, G. G.

Oct 48

USSR/Metals
Steel Plate
Strain Measurements

"Determination of the Conditional Yield Limit for
High Durability Steels, Rolled Into Plate," G. G.
Vasil'yev, Magnitogorsk Metal Combine, 6 pp

"Zavod Lab" Vol XIV, No 10

Complains that old methods of testing subject steel
plate are either too slow and laborious or cannot
be used for relatively thin plate. Discusses
method using Amsler-type machine and amplifying the
strain reading 20 times for closer gauging. Method
was tested and found much faster, and accurate
within 2%.

28/49T103

TARASENKO, A.Ye.; VASIL'YEV, G.G.

Conveyer-plow for shield protected coal mining. Ugol' 38
no.12:52-53 '63. (MIRA 17:5)

SOV/67-59-5-4/30

14(1)
AUTHOR:

Vasil'yev, G. G., Engineer

TITLE:

On a Uniform Consumption of Liquid Oxygen in Gasifiers
Connected in Parallel

PERIODICAL:

Kislod, 1959, Nr 5, pp 15 - 19 (USSR)

ABSTRACT:

In order to ensure a uniform consumption of liquid oxygen in 4 gasifiers working in parallel, the coefficient of non-uniformity $K = Q_{\max}/Q_{\min}$ is not to exceed the value of 1.2.

Q_{\max} and Q_{\min} , respectively, denote the maximum and minimum consumption of liquid oxygen per unit of time. To investigate the working conditions for guaranteeing this value K, laboratory investigations were carried out. The operation scheme of the gasifiers has already been described in a previous paper. The arrangement of the four gasifiers connected in parallel is shown in figure 1. Besides the common gas outlet pipe, also a connecting gas pressure expansion pipe is installed. The reasons for the nonuniform working were investigated, and explained by the construction of the individual gasifiers. They work at a somewhat different pressure thus ✓

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